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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,446	08/28/2003	Kalin Spariosu	PD-02W148	6732
23915	7590	10/04/2005	EXAMINER	
PATENT DOCKET ADMINISTRATION RAYTHEON SYSTEMS COMPANY P.O. BOX 902 (E1/E150) BLDG E1 M S E150 EL SEGUNDO, CA 90245-0902			FLORES RUIZ, DELMA R	
			ART UNIT	PAPER NUMBER
			2828	
DATE MAILED: 10/04/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/650,446

Applicant(s)

SPARIOSU ET AL.

Examiner

Delma R. Flores Ruiz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 and 17 is/are allowed.
- 6) ☒ Claim(s) 1-8 and 18 - 24 is/are rejected.
- 7) ☒ Claim(s) 9 - 15 and 25 - 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/23/03, 6/20/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 08/28/2003, and 06/20/2005 have been considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 7, 18 – 19, 21, and 23 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ohishi et al. (6,278,719).

Regarding claim 1, Ohishi discloses a laser, comprising: a medium doped (see Fig. 7, Character 4) with first ions that emit light at a laser wavelength as a result of the transition of electron energy from an upper energy level manifold to a lower energy level manifold; a first pump light (see Fig. 7, Character 5) aligned to couple energy into said

medium at a first wavelength that excites a first portion of said first ions into said upper energy level manifold; and a second pump light (see Fig. 7, Character 3) aligned to couple energy into said medium at a second wavelength that excites a second portion of said first ions to a third energy level manifold, a fraction of which relax to said upper energy level manifold and thereby increase the total quantity of said first ions at said upper energy level manifold, increasing the energy emitted at said laser wavelength (Abstract, Column 6, Lines 14 – 34, 54 – 67, Column 7, Lines 38 – 38 and Column 8, Lines 1 – 8).

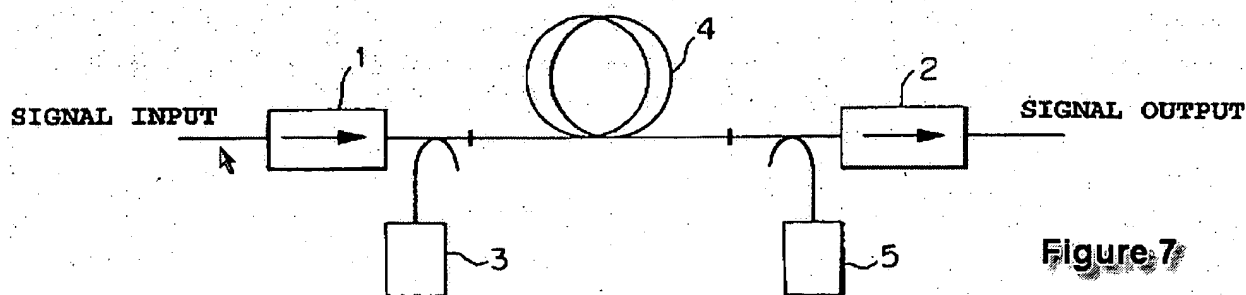
Regarding claims 2 and 19, Ohishi disclose a medium is a crystal (Abstract, Column 7, Lines 38 – 46).

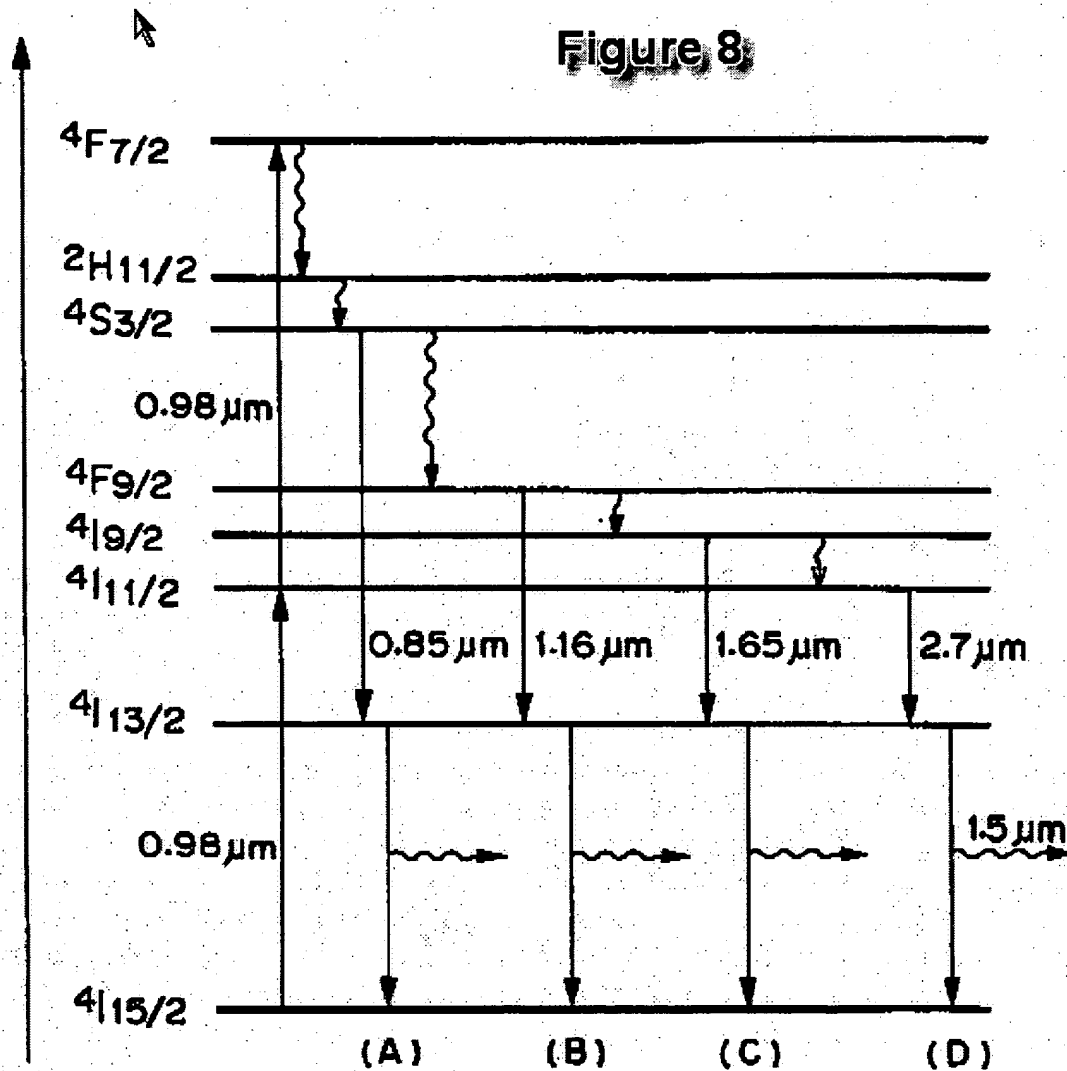
Regarding claims 5 and 21, Ohishi discloses first ions are erbium ions, and wherein said lower energy level manifold is the erbium $^4I_{15/2}$ manifold, said upper energy level manifold is the erbium $^4I_{13/2}$ manifold, and said third energy level manifold is the erbium $^4I_{11/2}$ manifold.

Regarding claims 7 and 23 Ohishi discloses first pump light is a light emitting diode array and said second pump light is a erbium: fiber laser that emits energy at a wavelength near 980 nanometers (Column 6, Lines 14 – 39, 54 – 61).

Regarding claim 18, Ohishi discloses a method of producing laser light in a laser having a medium doped (see Fig. 7, Character 4) with first ions that emit light at a laser wavelength as a result of the transition of electron energy from an upper energy level manifold to a lower energy level manifold, and having a first pumplight (see Fig. 7, Character 5) operable to output energy at a first wavelength, and a second pumplight (see Fig. 7, Character 3) operable to output energy at a second wavelength, the method comprising the steps of: coupling energy at the first wavelength from the first pumplight into the medium, thereby exciting a first portion of the first ions into the upper energy level manifold and coupling energy at the second wavelength from the second pumplight into the medium, thereby exciting a second portion of the first ions to a third energy level manifold, a fraction of which relax to said upper energy level manifold, thereby increasing the total quantity of the first ions at the upper energy level manifold, and increasing the energy emitted at said laser wavelength (Abstract, Column 6, Lines 14 – 34, 54 – 67, Column 7, Lines 38 – 38 and Column 8, Lines 1 – 8).

Figures 7 and 8, by Ohishi





Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, 8, 20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohishi et al. (6,278,719) in view of Govorkov et al (6,002,697).

Regarding claims 3, 4 and 20 Ohishi discloses the claimed invention except for a medium is selected from one of: Sc_2SiO_7 ; Sc_2SiO_5 ; YSiO_5 . YVO_4 , and similar materials including glasses and medium is yttrium-aluminum-garnet. Govorkov teaches a medium is selected from one of: Sc_2SiO_7 ; Sc_2SiO_5 ; YSiO_5 . YVO_4 , and similar materials including glasses and medium is yttrium-aluminum-garnet (Abstract). It would have been obvious at the time of applicant's invention, to combine Govorkov of teaching a medium is selected from one of: Sc_2SiO_7 ; Sc_2SiO_5 ; YSiO_5 . YVO_4 , and similar materials including glasses and medium is yttrium-aluminum-garnet with laser because it would have been obvious to one having ordinary skill in the art at the time the invention was made to medium is selected from one of: Sc_2SiO_7 ; Sc_2SiO_5 ; YSiO_5 . YVO_4 , and similar materials including glasses and medium is yttrium-aluminum-garnet, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding claims 8 and 24, Ohishi discloses the claimed invention except for the laser further includes a Q-switch disposed at an end of the medium, further comprising the step of emitting the laser light through the Q-switch upon reaching the switching threshold of the Q-switch, thereby emitting a short pulse of laser light. Govorkov teaches a laser further includes a Q-switch disposed at an end of the medium, further comprising the step of emitting the laser light through the Q-switch upon reaching the switching threshold of the Q-switch, thereby emitting a short pulse of laser light (Abstract, Column 3, Lines 50 – 67 and Column 4, Lines 1 – 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a Q-switch disposed at an end of the medium, further comprising the step of emitting the laser light through the Q-switch upon reaching the switching threshold of the Q-switch, thereby emitting a short pulse of laser light, since it has been well known in the art back in 1999, the Q-switching in the preferred setup changes the fraction of incident light it transmits in response to external control signals, relying either on acousto-optic or electro-optic interactions in the modulator crystal see (Abstract, Column 3, Lines 50 – 67 and Column 4, Lines 1 – 9).

Claims 6 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohishi et al. (6,278,719) in view of Teraoka (4,585,944).

Regarding claims 6 and 22, Ohishi discloses first wavelength is near 1540 nm, (Column 7, Lines 14 – 22) said second wavelength is near 980 nm (Column 6, Lines 14 – 39, 54 – 61).

Ohishi discloses the claimed invention except for and said laser wavelength is near 1640 nm (Column Line). It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a laser wavelength is 1640 nm, since it has been well known in the art back in Teraoka "944, see Column 2, Lines 23 – 24.

Allowable Subject Matter

Claims 9 – 15 and 25 – 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 16 – 17 are allowed.

Claim 16 recites a laser structure including the specific structure limitation of medium formed from ion doped yttrium-aluminum-garnet that emits laser light near 1640 nm wavelength: a diode array pump light aligned to couple energy near 1540 nm wavelength, for a first period of time that is approximately four milliseconds in duration,

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an erbium: fiber laser pumplight aligned to couple energy near 980 nm, for a subsequent period of time that is approximately two milliseconds in duration, into said medium and thereby excite a second portion of said erbium ions into the erbium ion $^4I_{11/2}$ energy level manifold, a fraction of which relax to the erbium ion $^4I_{13/2}$ energy level manifold and thereby increase the total quantity of said erbium ions at said $^4I_{13/2}$ manifold; and a Q-switch disposed at an end of said medium through which said emitted laser wavelength light exits said medium, which is neither anticipated or disclosed nor suggested in any piece of available prior art, which is neither anticipated nor obvious over the prior art of record.

Claim 17 recites a laser structure including the specific structure limitation of a medium formed from erbium ion and ytterbium ion doped yttrium-aluminum-garnet that emits laser light near 1640 nm wavelength; a first diode array pumplight aligned to couple energy near 1540 nm wavelength, for a first period of time that is approximately four milliseconds; *a second diode array pumplight aligned to couple energy near 940 nm, for a subsequent period of time that is approximately two milliseconds in duration, into said medium and thereby excite a portion of said ytterbium ions into the ytterbium $^4F_{5/2}$ energy level manifold, which induces an inter-ionic energy transfer to the erbium ion $^4I_{11/2}$ manifold, a fraction of which relax to the erbium ion $^4I_{13/2}$ energy level manifold and thereby increase the total quantity of said erbium ions at said $^4I_{13/2}$ manifold; and a Q-switch disposed at an end of said medium through which said emitted laser wave-*

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length light exits said medium, which is neither anticipated or disclosed nor suggested in any piece of available prior art, which is neither anticipated nor obvious over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (571) 272-1940. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Sun Harvey can be reached on (571) -272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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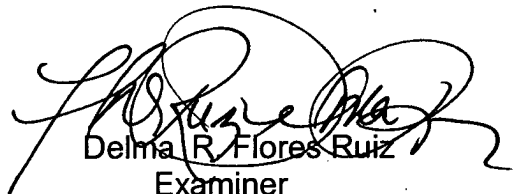
published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



Delma R. Flores Ruiz

Examiner

Art Unit 2828

DRFR/MH

September 27, 2005


JAMES MENEPEE
 Min Sun Harvey
Supervisor Patent Examiner
Art Unit 2828